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AUTHOR Dean, Lillian F.
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ABSTRACT

Household hazardous materials are products or wastes which are toxic, corrosive, reactive, and/or ignitable. Although common products such as pesticides, oils, gasoline, solvents, cleaners, and polishes are hazardous, students and adults are not always aware of potential dangers. This sourcebook contains definitions and examples of household hazardous materials, includes information about pesticide and chemical product labels, and presents classroom projects and worksheets which may be used with a variety of curricula. A discussion of automotive products, household cleaners and polishes, paints and solvents, hobby and art supplies, pesticides and herbicides, personal and health care products, aerosol sprays, and alcohol, tobacco, and plants is included. (KR)

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HOUSEHOLD HAZARDOUS MATERIALS AND LABELS: A REFERENCE FOR TEACHERS

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HOUSEHOLD HAZARDOUS MATERIALS AND THEIR LABELS

A Reference for Teachers

Written by
Lillian F. Dean
Project Director
West Oakland Groundwater Leadership Team

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(313) 258-5188

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PART I: WHAT ARE HOUSEHOLD HAZARDOUS MATERIALS ?

A. Introduction

Household hazardous materials are products or wastes which are toxic, corrosive, reactive, and/or ignitable. Although common products such as pesticides, oils, gasoline, solvents, cleaners, and polishes are hazardous, students and adults are not always aware of potential dangers.

Hazardous materials can cause illness or injury if they are ingested, inhaled, or absorbed. In addition, careless disposal of household hazardous materials can lead to environmental contamination. The human health and environmental risks associated with various handling and disposal practices, of course, vary with the type and quantity of the chemical, the individual, environmental conditions, and other factors.

Identification of household hazardous materials is the first step towards environmentally-sound management of hazardous substances found in the home. In many cases, product labels are useful in identifying hazardous materials. Label-reading, therefore, can be a critical first step leading toward safer storage, use and disposal practices.

B. Why Be Concerned?

By the fall of 1989, the Michigan Department of Natural Resources had identified more than 2700 sites of environmental contamination statewide. Many of the contamination sites have been linked to poor waste disposal practices which are not likely to continue in the future. Despite this finding, however, new sites are being added to the list each month. Public education concerning hazardous materials of all types - in homes and at businesses - is critically needed.

Many of the pollutants identified at contamination sites are hazardous substances such as fuel oil, gasoline, chemicals, solvents, wood preserving wastes, acids, heavy metals, PCBs, PCE (perchloroethylene) and TCE (trichloroethylene), among many others. Improper handling of hazardous materials at business and industry sites, including improper storage and waste disposal, are evidenced by the state's contamination site list and inventory.

The connection between household hazardous substances, improper disposal practices, and groundwater contamination has not been carefully researched. However, the potential for the contamination of groundwater close to home remains. Some types of household chemicals, when allowed to enter the soils in quantity, can reach groundwater at the site and may then migrate to adjacent streams and lakes. Why wait for problems to be spotted before taking positive steps to protect the environment?

The health hazards associated with direct ingestion, absorption, or inhalation of household hazardous materials have been recognized for many years. Even so, persons who use and handle hazardous materials sometimes forget the importance of care in handling. This observation is supported by the large number of telephone calls (sometimes 200/day) related to

household accidents which are received by the Detroit Poison Control Center.

Further definition and examples of household hazardous materials are presented in the remaining subsections of Part I of this booklet. Part II includes information about pesticide and chemical product labels. Part III presents classroom projects and worksheets which may be used with a variety of curricula.

C. Definition and Examples of Household Hazardous Materials

Hazardous substances have one or more of the following characteristics:

> Toxic: Poisonous, potentially harmful to human health; can cause cancer and birth defects; can harm or kill fish and wildlife (e.g., pesticides, many household cleaners, and thinners).
>
> Corrosive: Can corrode storage containers or damage human tissue if it is touched (e.g., acids and certain cleaners).
>
> Reactive: An unstable substance which can react or explode if exposed to heat, shock, air or water (e.g., explosives).
>
> Ignitable: A substance which can catch on fire (e.g., gasoline, fuel oil, and paint thinner).

"Toxic" materials are a subset of "hazardous" materials, although the terms are sometimes used interchangeably. The term "toxicity" refers to the degree to which a substance is poisonous. The dose as well as the type of material influences relative toxicity (see Figure 1).

Selected categories of household hazardous substances are briefly listed below. This list focuses on substances which are the most likely to migrate rapidly through the environment and pose threats to groundwater and surface water quality.

1. Automotive Products

Gasoline, motor oil, lead-acid batteries, anti-rust agents, antifreeze, degreasers, and other products used with automobiles, motorcycles, bicycles, and lawn mowers are toxic and are also extremely flammable.

Gasoline consists of hundreds of different types of hydrocarbons, some naturally found in crude petroleum and many others from therefining processes and chemical additives. Although no-lead gasoline does not contain lead, it does contain benzene (a known cancer-producing substance) and other toxic chemicals.

Motor oil is toxic, both before and after its use as a lubricant. Unused motor oil contains toxic chemical additives. Used motor oil may contain lead and other metals which accumulate during engine use.

Lead-acid batteries are a major hazard, probably far more hazardous than

Figure 1

GENERAL TOXICITY RATINGS FOR SOME HOUSEHOLD PRODUCTS

Practically Nontoxic	Slightly Toxic	Moderately Toxic	Very Toxic	Extremely Toxic	Super Toxic
More than 1 Quart	1 Pint to 1 Quart	1 Ounce to 1 Pint	1 Tsp. to 1 Ounce	7 Drops to 1 Tsp.	A taste (less than 7 drops)
Foods	Dry cell batteries	Antifreeze	Toilet bowl cleaners	Some pesticides & herbicides:	A few pesticides:
Candies	Glass cleaner	Automotive cleaners	Deodorizers	-Aldrin	-Paroxon
Lead pencils	Deodorants	Household bleach	Engine motor cleaners	-Eldrin	-Phosdrin
Eye makeup	Hand soap	Many detergents	Fertilizers	-Bidrin	-Parathion
		Floor cleaners	Paint brush cleaners	-Methyl parathion	-Isobenzan
		Metal cleaners	Paint remover	-Paraquat	-Pyrazoyan
		Oven cleaners	Varnish remover	Some fertilizers	
		Fuels	Fireworks	Mercury cell battery	
		Lubricating oils	Mildew proofing		
		Spot remover	Water color solvents		
		Disinfectants	Lacquer thinners		
		Floor polish	Many pesticides:		
		Shoe polish	-DDT		
		Most paints	-Chlordane		
			-Heptachlor		
			-Lindane		
			-Mirex		
			-Diazinon		
			-Malathion		
			-Diquatdibromide		
			-Endothall		
			-2,4D		

NOTE: NOT ALL BRANDS OR TYPES OF PRODUCTS LISTED ABOVE ARE OF THE SAME TOXICITY. THESE ARE EXAMPLES ONLY

Source: Gosselin et al., 1957, 1976

any of the substances listed here except for gasoline.

Antifreeze is a particular hazard to pets since it has a sweet taste.

Gasoline, motor oil (both new and used oil), and other automotive products are often carelessly handled or allowed to spill or drip on the garage floor or ground. Products may come in frequent contact with the skin. Because of the volatile nature of some products (such as gasoline), fumes in contained areas are also a hazard.

When using automotive products and oil, it is wise to work in a ventilated, open area. Any spills or leaks of materials should be quickly wiped up with absorbent materials and discarded in the trash. Care should be taken to avoid skin contact - gloves should be worn.

2. Household Cleaners and Polishes

The number and type of household cleaners available to the consumer is almost limitless. Oven cleaners, drain cleaners, bleaches, toilet bowl cleaner, and scouring powders, among others, contain reactive chemicals. Examples of hazardous chemicals found in cleaning agents include sodium phosphate, sodium silicate, sodium hydroxide, and sodium hypochlorite.

Dangerous reactions may occur if several types of cleaners are mixed together. For example, bleach and ammonia should never be mixed.

Furniture polish, spot removers, and floor polish often contain solvents which are both flammable and poisonous.

Clothing and fabric care/cleaning products may contain perchloroethylene, tetrachloroethylene, trichloroethylene, naphtha, ammonium hydroxide, benzene, toluene, and others. These chemicals are volatile, and should not be inhaled.

Furniture and floor polishes may contain the highly toxic ingredients of nitrobenzene and dinitrobenzene. Petroleum distillates and petroleum naphtha (mineral spirits) are found in many polishes, and can produce skin irritation.

Small children are sometimes attracted to the interesting and colorful bottles of home cleaners and polishes. Bottles may accidentally be left unattended on the floor - in reach of small hands.

If used up in small quantities according to directions, the quantity of leftover for disposal can be minimized. Always read the label carefully and be aware of potential use hazards. If a product cannot be used up, try sharing it with a friend or neighbor.

3. Paints and Solvents

Oil-based paints and solvents are toxic and flammable. Most injuries from paint products are from acute poisoning and chemical burns, most frequently damaging the eyes. Accidents may occur if containers are carelessly left open or if paint brushes are left soaking in places accessible to children and pets. Other hazards may arise if solvents are

transferred to unlabeled or mislabeled containers.

A solvent is a substance which dissolves another substance. Water is the most common solvent - but there are other types as well such as petroleum distillates, toluene, benzene, xylene, turpentine, alcohols, methylene chloride, tricholorethane, and others. These solvents and others are used for home painting, staining and varnishing products, as well as for stain and paint removers.

When using paints and solvents, indoor work should be avoided, especially in a closed room without air ventilation.

Paints and thinners can be solidified before disposal in the trash simply by pouring absorbent kitty litter or sand into the container. When left to stand, sludges from paint thinners settle to the bottom, providing some solvent for reuse. Leftover paints and thinners should never be buried or poured directly on the ground.

4. Hobby and Art Supplies

Many of the toxic chemicals listed in previous sections are also found in hobby, art, and craft supplies used at home and at school. For example, solvents are commonly used for various purposes. Pigments, dyes, glazes and inks may contain lead, chromium, and other toxic metals which are skin irritants and dangerous to health. Metals used in soldering and welding pose danger from inhalation of toxic fumes. Many glues are flammable, and some are skin and lung irritants.

Good ventilation and air circulation is important when using such materials. Use hazardous materials according to the directions on the label and use up whenever possible.

5. Pesticides and Herbicides

Pesticides and herbicides are commonly used out-of-doors to control pests and weeds. Pesticides are products designed to kill and control pests; herbicides are made to kill and control weeds. Products often contain toxic and highly toxic ingredients which may pose dangers if ingested or absorbed in small quantities.

Animal pesticides take a variety of forms in the home - ant poison, slug bait, spray insect repellents, no-pest strip, flea collars, rodent bait, etc. Most animal pesticides are highly toxic, even in small quantities. One of the biggest concerns about the chemicals in pesticide products is that the long-term effects on humans exposed to the pesticides are often unknown. A number of ingredients have been linked to cancer. Some types of chemicals found in pesticides are extremely persistent in animals and the environment, raising questions about possible long-term effects from exposure.

Some pesticides have been banned from commercial use due to environmental and health concerns. If high hazard pesticides are found in the home or garage, advice about proper disposal may be obtained from the Southeast Michigan Household Hazardous Waste office of the County Cooperative Extension Service (1-800-468-9612).

Dangers from pesticide use include skin contact, inhalation of vapors and dusts from tree spraying, home fumigation for roaches and other pests, accidental spillage, and food contamination from garden or agricultural spraying. Pesticide labels are usually more extensive and complete than other types of hazardous substances and should always be read. Note carefully the signal words reflecting the relative degree of toxicity and hazard to human health.

Pesticides are often over-applied, or applied at the wrong time. Always identify the nature and scope of any infestation before applying pesticides. The right product can only be selected if the problem is identified. Certain pesticides, for example, should only be applied at certain times of the year.

6. Personal and Health Care Products

Common products such as nail polish remover, makeup, and shoe polish are often poisonous. Pills and medicines are also hazardous, especially to children who may believe they are "candy."

Routine cupboard cleaning and disposal of old prescription drugs and personal health care products is a safety precaution. Drugs and medicines should be kept on high shelves out of the reach of children. Keep the childproof tops tightly fastened.

7. Aerosol Sprays

Some household products are available in aerosol spray containers - a factor which can add a source of air pollution within the home.

Aerosol sprays contain an active ingredient (deodorant, window cleaner, etc.) and liquid or gaseous propellant packed under pressure. The propellant and active ingredient are expelled in the form of a fine mist. The small size of the particles makes it possible for chemicals to be inhaled deeply into the lungs and quickly absorbed into the bloodstream. The combined effects of the ingredients common in aerosol spray products is another area of concern.

Prior to 1978, fluorocarbons were used as the propellant. Due to possible adverse environmental effects of these chemicals, fluorocarbons have mostly been phased out. Propane is one of several substances which have replaced fluorocarbons. Although perhaps less toxic than fluorocarbons, propane and other propellants are flammable, adding to the fire hazards.

Pressurized cans are dangerous and can explode if heated. Even empty aerosol cans may explode if burned or crushed.

8. Alcohol, Tobacco, and Plants

Alcoholic beverages, tobacco products, and certain plants pose human health hazards, especially if ingested by small children.

PART II: LABELS ON HOUSEHOLD HAZARDOUS MATERIALS

A. Introduction

Labels on household hazardous products sometimes provide the following useful information:

- -Ingredients and quantities;
- -Hazard warnings;
- -Instructions for use;
- -Instructions for storage;
- -Instructions for disposing of the container or leftover product.

Whether or not this type of information is on the label depends upon (1) the interest of the manufacturer in complying with the letter and spirit of the law; (2) federal labeling regulations applying to the product; and (3) the interest of the manufacturer in exceeding minimum legal requirements.

The age of the product also is related to the accuracy of the label. Although many of the federal labeling requirements have not changed, manufacturers are recognizing their legal liability if careful instructions concerning use and hazards are not provided.

Two federal laws are particularly important for household hazardous products and labeling:

-The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), administered by the U.S. Environmental Protection Agency. This law regulates only pesticides.

-The Federal Hazardous Substances Act (FHSA) which regulates products other than pesticides which contain hazardous substances. This law defines the term hazardous is defined as products with toxic, corrosive, irritating, flammable or radioactive characteristics.

These two laws are based on the premise that accurate and complete labels are essential for consumer health protection. Label information on household hazardous products manufactured in the past two years or so can be of substantial help to the consumer for health protection in the home.

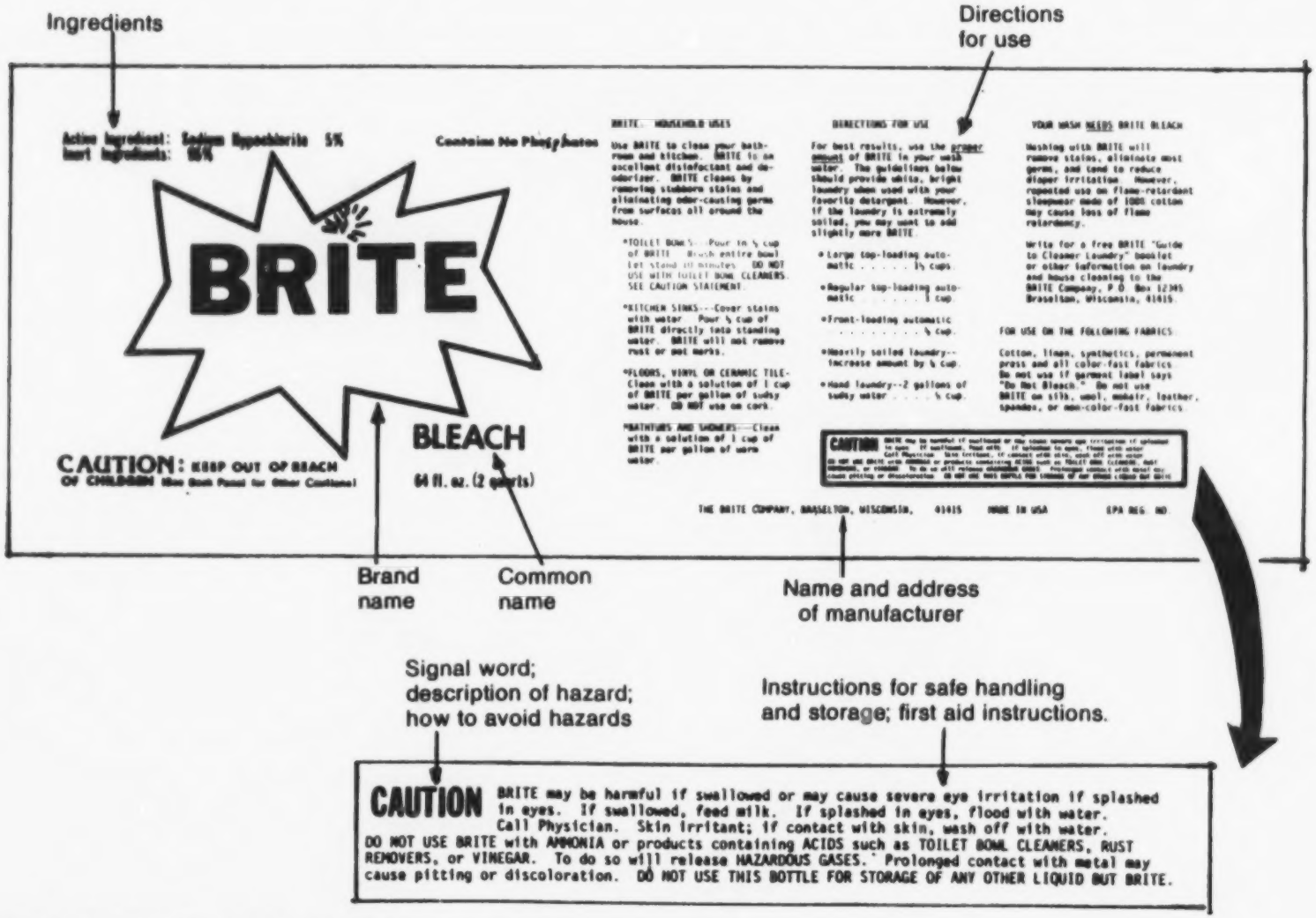
B. Hazardous Substances Labels

Current labeling regulations for hazardous substances other than pesticides require the following (see Figure 2):

- -Signal words, such as "poison" or "warning", or the skull and crossbones symbol (as appropriate to the product in question).
- -Affirmative statements of the principal hazard(s) associated with the substance.
- -The common name or the chemical name.
- -Name and place of business of manufacturer or distributor.

Figure 2

READING A HOUSEHOLD HAZARDOUS SUBSTANCE LABEL


Ingredients
Directions for use
Active Ingredient: Sodium Hypochlorite 5%
Inert Ingredients: 95%
Contains No Phosphates
BRITE
BLEACH
64 fl. oz. (2 quarts)
CAUTION: KEEP OUT OF REACH OF CHILDREN
BRITE - HOUSEHOLD USES
DIRECTIONS FOR USE
YOUR WASH NEEDS BRITE BLEACH
FOR USE ON THE FOLLOWING FABRICS
THE BRITE COMPANY, BRASELTON, WISCONSIN, 41415 MADE IN USA EPA REG NO
Brand name
Common name
Name and address of manufacturer
Signal word; description of hazard; how to avoid hazards
Instructions for safe handling and storage; first aid instructions.
CAUTION BRITE may be harmful if swallowed or may cause severe eye irritation if splashed in eyes. If swallowed, feed milk. If splashed in eyes, flood with water. Call Physician. Skin irritant; if contact with skin, wash off with water.
DO NOT USE BRITE with AMMONIA or products containing ACIDS such as TOILET BOWL CLEANERS, RUST REMOVERS, or VINEGAR. To do so will release HAZARDOUS GASES. Prolonged contact with metal may cause pitting or discoloration. DO NOT USE THIS BOTTLE FOR STORAGE OF ANY OTHER LIQUID BUT BRITE.

Source: Adapted from "How to Read a Chemical Product Label," Michigan State University, Cooperative Extension Service, 1984.

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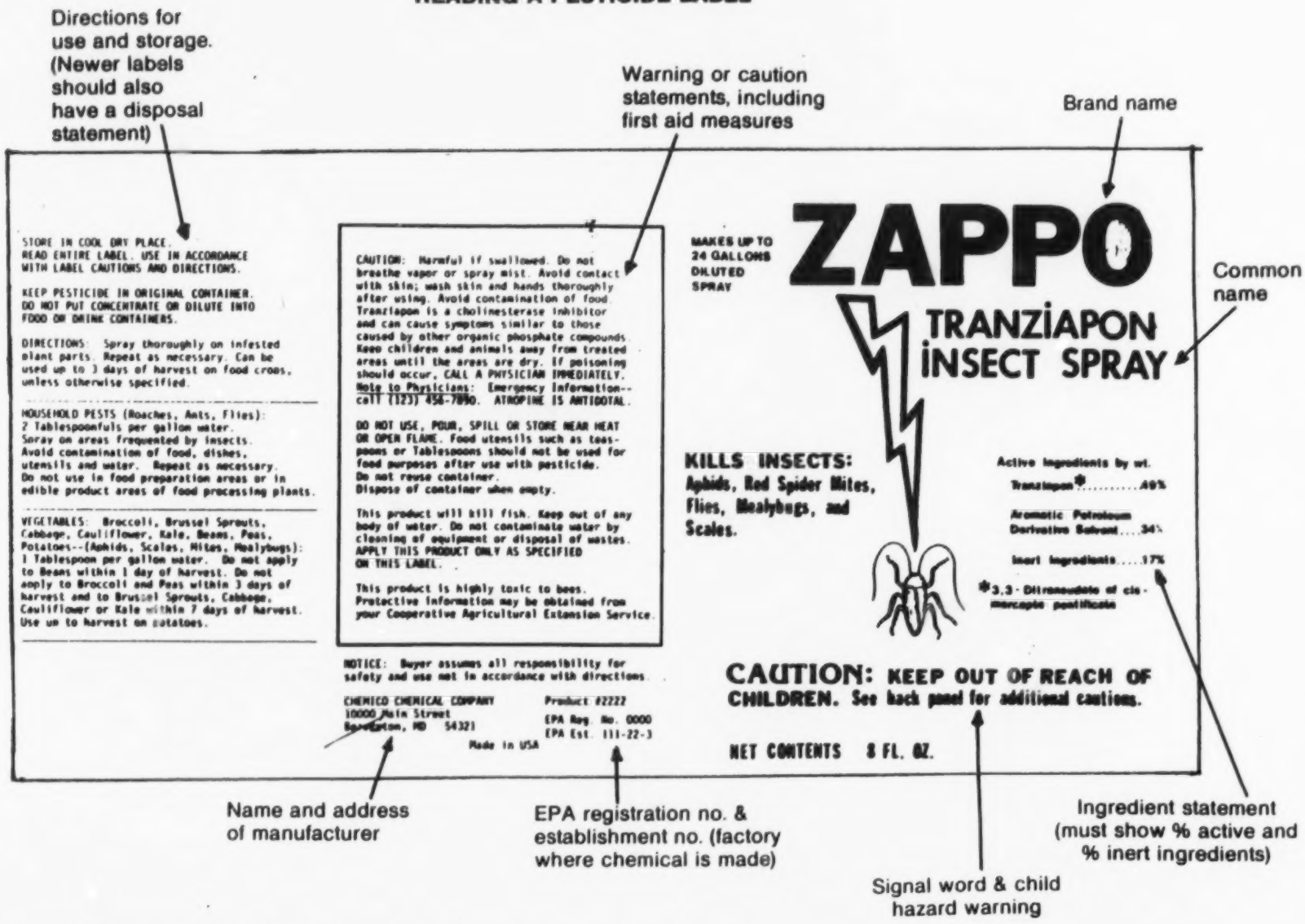
Figure 3

READING A PESTICIDE LABEL


Directions for use and storage. (Newer labels should also have a disposal statement)
Warning or caution statements, including first aid measures
Brand name
Common name
STORE IN COOL DRY PLACE.
READ ENTIRE LABEL. USE IN ACCORDANCE WITH LABEL CAUTIONS AND DIRECTIONS.
KEEP PESTICIDE IN ORIGINAL CONTAINER. DO NOT PUT CONCENTRATE OR DILUTE INTO FOOD OR DRINK CONTAINERS.
DIRECTIONS: Spray thoroughly on infested plant parts. Repeat as necessary. Can be used up to 3 days of harvest on food crops, unless otherwise specified.
HOUSEHOLD PESTS (Roaches, Ants, Flies): 2 Tablespoonfuls per gallon water. Spray on areas frequented by insects. Avoid contamination of food, dishes, utensils and water. Repeat as necessary. Do not use in food preparation areas or in edible product areas of food processing plants.
VEGETABLES: Broccoli, Brussel Sprouts, Cabbage, Cauliflower, Kale, Beans, Peas, Potatoes--(Aphids, Scales, Mites, Mealybugs): 1 Tablespoon per gallon water. Do not apply to Beans within 1 day of harvest. Do not apply to Broccoli and Peas within 3 days of harvest and to Brussel Sprouts, Cabbage, Cauliflower or Kale within 7 days of harvest. Use up to harvest on potatoes.
CAUTION: Harmful if swallowed. Do not breathe vapor or spray mist. Avoid contact with skin; wash skin and hands thoroughly after using. Avoid contamination of food. Tranziapon is a cholinesterase inhibitor and can cause symptoms similar to those caused by other organic phosphate compounds. Keep children and animals away from treated areas until the areas are dry. If poisoning should occur, CALL A PHYSICIAN IMMEDIATELY. Note to Physicians: Emergency information--call (123) 456-7890. ATROPINE IS ANTIDOTAL.
DO NOT USE, POUR, SPILL OR STORE NEAR HEAT OR OPEN FLAME. Food utensils such as teaspoons or Tablespoons should not be used for food purposes after use with pesticide. Do not reuse container. Dispose of container when empty.
This product will kill fish. Keep out of any body of water. Do not contaminate water by cleaning of equipment or disposal of wastes. APPLY THIS PRODUCT ONLY AS SPECIFIED ON THIS LABEL.
This product is highly toxic to bees. Protective information may be obtained from your Cooperative Agricultural Extension Service.
NOTICE: Buyer assumes all responsibility for safety and use not in accordance with directions.
CHEMICO CHEMICAL COMPANY
10000 Main Street
Sometown, MD 54321
Made in USA
Product #2222
EPA Reg. No. 0000
EPA Est. 111-22-3
MAKES UP TO 24 GALLONS DILUTED SPRAY
ZAPPO
TRANZIAPON INSECT SPRAY
KILLS INSECTS: Aphids, Red Spider Mites, Flies, Mealybugs, and Scales.
Active Ingredients by wt.
Tranziapon* 49%
Aromatic Petroleum Derivative Solvent ... 34%
Inert Ingredients 17%
*3,3-Ditrenoudate of cis-mercapto pentifacin
CAUTION: KEEP OUT OF REACH OF CHILDREN. See back panel for additional cautions.
NET CONTENTS 8 FL. OZ.
Name and address of manufacturer
EPA registration no. & establishment no. (factory where chemical is made)
Signal word & child hazard warning
Ingredient statement (must show % active and % inert ingredients)

Source: Adapted from "How to Read a Chemical Product Label," Michigan State Univ., Cooperative Extension Service, 1984.

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TOXICITY RATING SCALE FOR PESTICIDES

Figure 4

IF THE LABEL HAS THIS SIGNAL WORD ..... YOU KNOW THAT THIS IS HOW TOXIC THE PRODUCT IS.

Category	Signal Word required on label	Approximate amount needed to kill an average person	*Precautionary Statements by Toxicity Category*	
			Oral, inhalation or dermal toxicity	Skin and eye local effects
I highly toxic	DANGER-POISON	a few drops to one teaspoon	Fatal (poisonous) if swallowed (inhaled or absorbed through skin). Do not breathe vapor (dust or spray mist). Do not get in eyes, on skin or on clothing. (Front panel statement of practical treatment required.)	Corrosive, causes eye and skin damage (or skin irritation.) Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed. (Appropriate first aid statement required.)
II moderately toxic	WARNING	1 teaspoon to one ounce	May be fatal if swallowed (inhaled or absorbed through the skin). Do not breathe vapors (dust or spray mist). Do not get in eyes, on skin or on clothing. (Appropriate first aid statements required.)	Causes eye (and skin) irritation. Do not get in eyes, on skin or on clothing. Harmful if swallowed. (Appropriate first aid statement required.)
III slightly toxic	CAUTION	over one ounce	Harmful if swallowed (inhaled or absorbed through the skin.) Avoid breathing vapors (dust or spray mist. Avoid contact with skin (eyes or clothing). (Appropriate first aid statements required.)	Avoid contact with skin, eyes or clothing. In case of contact, immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.
IV not toxic	none required		No precautionary statement required.	No precautionary statement required.

Source: "How to Read a Chemical Product Label," Michigan State University, Cooperative Extension Service, 1984, p. 2.

-Description of hazard (such as "vapor harmful", "flammable," absorbed through the skin", etc.).
-Statements of precautionary measures to avoid the hazard.
-Instructions, when appropriate, for special handling and storage.
-The statement "Keep Out of the Reach of Children" or its practical equivalent.
-First aid instructions, when necessary or appropriate.

All such statements must be located prominently on the label, and must appear in conspicuous and legible type in contrast with other printed information on the label. Due to lack of enforcement, knowledge, or deliberate non-compliance, labels of hazardous substances found in the home do not always include this information.

It is interesting to read labels of household hazardous products, and to separate the information required by law for safety and health protection purposes from the information advertising the brand name and effectiveness. A review of only a few containers illustrates the point that the letter of the law may be met without the intent. Many hazard warnings and instructions are printed small on the back of the package or container. Unless the consumer is alert to potential hazards, even basic use and application information may be overlooked.

C. Pesticide Labels

Labeling requirements for pesticides are somewhat more restrictive than other hazardous substances. In 1972, U.S. Congress required the U.S. Environmental Protection Agency to review and re-register all pesticide products. Setting up the registration system took until 1980, and many of the results and benefits to the consumer for labels are only now being realized. The re-registration process is leading to additional use restrictions on certain pesticides, and labels which more substantially meet the requirements of the law. U.S. Environmental Protection Agency registration numbers must be on the label.

Other pesticide label requirements include the following (see Figure 3):

-Ingredient statement, including the percent that is an active ingredient and the percent that is an inert ingredient.
-Warnings and precautionary statements, including human hazard signal words.
-Type of formulation (such as liquid or powder) and how to use.
-Child hazard warning "keep out of reach of children" on the front label.
-Directions for use.
-EPA registration number and the establishment number (for the factory where the chemical is made)
-Name and address of manufacturer.
-Statement of practical treatment which tells you how to avoid hazards, emergency first aid measures, and the type of exposure which requires medical attention.

The signal word requirements for pesticides are based upon toxicity

categories (see Figure 4). Precautionary statements appropriate for the toxicity category must be included.

Pesticide labels are the law. As a result, some pesticide containers say directly that "it is a violation of federal law to use the product inconsistently with the label." Even with proper labeling, however, manufacturers of pesticides are required to assure that there are "no reasonable adverse effects" for the products. The implications and meaning of the simple terms "no reasonable adverse effects" has been the subject of lawsuits and disputes.

Pesticide labels, unlike other hazardous substances, are required to have disposal instructions. Under the federal Resource Conservation and Recovery Act (RCRA) which became law in 1978, the U.S. Environmental Protection Agency (EPA) did not initially offer guidance to pesticide manufacturers in meeting this requirement. In 1983, however, EPA sent a letter of interpretation to affected pesticide manufacturers, allowing two years for manufacturers to add disposal information to their labels.

The standard advice of the EPA concerning disposal is to rinse the container, wrap it in newspaper, and discard it in the trash. As a result, this basic recommendation is stated on many new pesticide labels. EPA does not require more specific information because disposal requirements and options vary among the states.

A review of a typical household's collection of hazardous products often reveals the following:

1. Although many specific labeling requirements must be met, the brand name and "effectiveness" of the product are the dominant words and impression of the label.

2. Many labels, especially on new products, have useful information about ingredients, instructions for use, and hazards for use. Even when written in small letters, it is always wise to read the label first and use according to direction.

3. Since adverse effects of hazardous products vary among individuals, information on labels concerning use should be adjusted to individual circumstances. If you are sensitive to certain chemicals, seek medical assistance and cease use of the products in question.

4. Key signal words such as the skull and crossbones, danger, and caution can help identify hazardous products.

5. Although pesticide labels must include a statement about proper disposal, such statements should never be regarded as complete.

As time goes on and regulations are followed and enforced more stringently, it is expected that labels will be a more useful guidepoint for hazardous substance use than in the past.

D. Managing Household Hazardous Materials

To avoid accidents in the home and to reduce any possibility of environmental contamination from hazardous materials, the following steps are suggested:

1. Inventory the hazardous substances in your home. Are they all needed? Are the bottles, jars, and other containers stored in safe locations out-of-reach of children? Can the products be used up according to directions before disposal?

2. Don't purchase new household hazardous materials if other products will do. For example, some non-hazardous degreasers are now on the market. It may be possible to use water-based latex paint as a substitute for oil-based paints.

3. Recycle household hazardous substances whenever possible. Used motor oil can be taken to a gasoline service station where it is picked up for recycling.

4. Be aware of groundwater levels, lakes, and streams near your home. Overuse of pesticides or runoff of oil out-of-doors can affect nearby surface waters and groundwater.

5. When disposing of paint products, solvents, and cleaners, allow the materials to evaporate or dry out in an outdoors area away from children and pets. When mostly dry, add kitty litter, dirt, or sawdust. Then wrap with plasatic bags and dispose in garbage.

It is legal in Michigan to dispose of household hazardous materials with the trash. However, it makes the best sense from an environmental protection standpoint to minimize the quantity requiring disposal.

PART III: PROJECTS FOR THE HOME AND CLASSROOM

The topic of household hazardous materials and label reading can be integrated into courses such as the following:

- -Science, especially chemistry
- -Mathematics (quantitative aspects of label reading)
- -Home economics
- -English (comprehension of labels)
- -Social studies

The topic may be covered in a single classroom session, or extended over three or four days. One recommended sequence involving two classroom sessions (one hour each) and two home assignments is outlined below.

Day 1, Classroom: WHAT ARE HOUSEHOLD HAZARDOUS MATERIALS?

- -Introduction and definitions
- -Hazardous products found in the home
- -How to read a label
- -Label reading worksheet

Day 1, Home Assignment: HOUSEHOLD HAZARDOUS MATERIALS INVENTORY

-With parental supervision, students complete an inventory of hazardous materials in their home (Checklist at back of this book may be used.)

Day 2, Classroom: THE IMPORTANCE OF READING LABELS

- -Additional label reading projects
- -Reducing hazardous materials in the home and school; are alternatives available or feasible?
- -Best practices for recycling and disposal

Day 2, Home Assignment: SAFE DISPOSAL OF HOUSEHOLD HAZARDOUS MATERIALS

-Students review the "tips for disposal" handout, and then complete the worksheet titled "home practices to protect groundwater".

* * * * * *

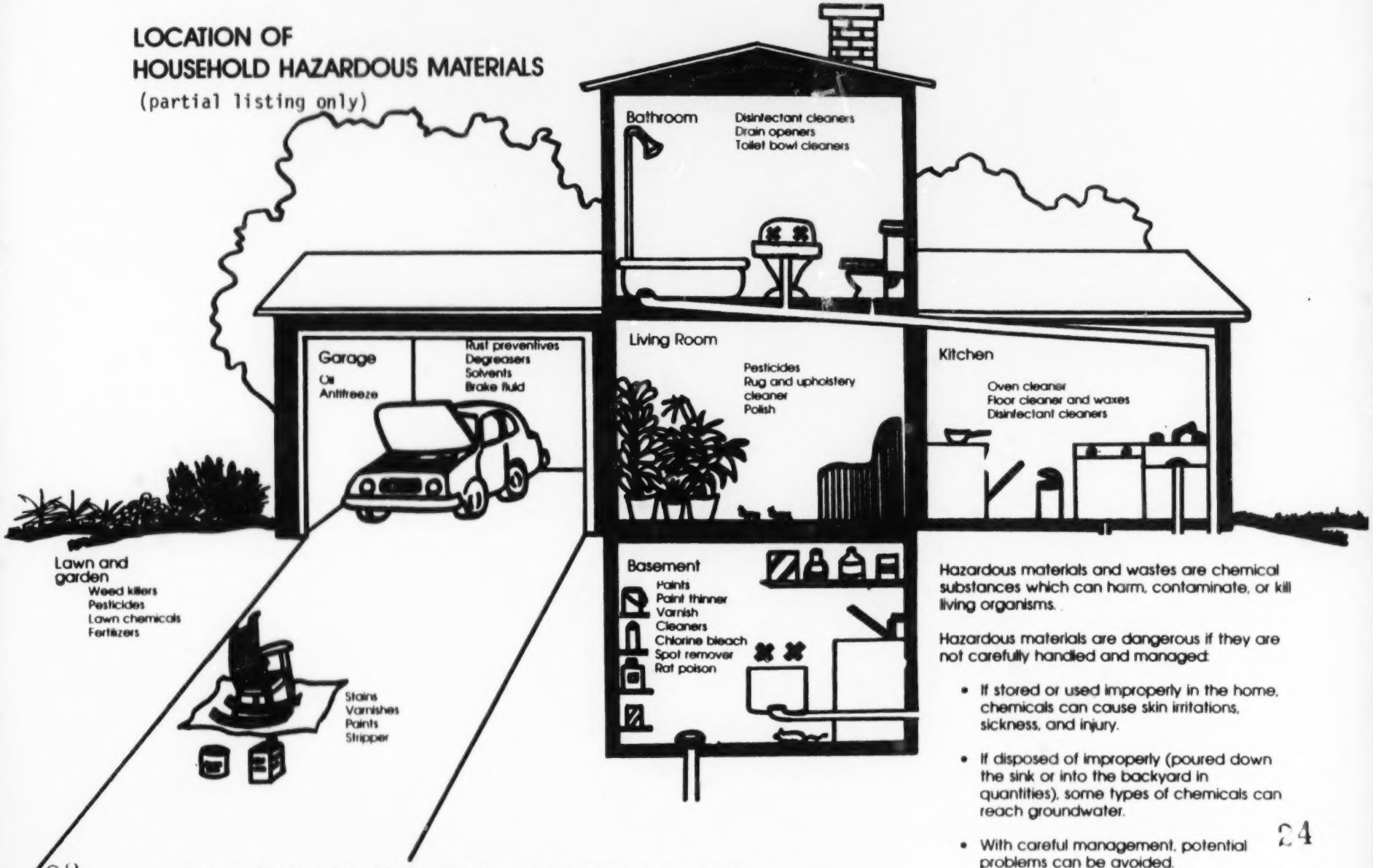
These worksheets have been pretested in junior high and middle school classrooms in West Oakland County, Michigan. Teachers are encouraged to use these source materials in combinations best suited to the course curriculum and student skills.

* * * * * *

Note: The Poison Control Center based at Children's Hospital of Michigan has pamphlets available upon request. One pamphlet is titled "Guide to Poison Prevention" and includes a useful inventory checklist and first aid for poisoning. Telephone stickers are also available. For information, telephone (313) 745-5711 or (800) 462-6642.

LOCATION OF HOUSEHOLD HAZARDOUS MATERIALS

(partial listing only)



Hazardous materials and wastes are chemical substances which can harm, contaminate, or kill living organisms.

Hazardous materials are dangerous if they are not carefully handled and managed:

- If stored or used improperly in the home, chemicals can cause skin irritations, sickness, and injury.
- If disposed of improperly (poured down the sink or into the backyard in quantities), some types of chemicals can reach groundwater.
- With careful management, potential problems can be avoided.

Source: Diagram from Metropolitan Seattle Sleuth report, modified by the East Michigan Environmental Action Council

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"COOKIES AREN'T THE ONLY THINGS LITTLE KIDS PUT IN THEIR MOUTHS WHEN GROWN-UPS AREN'T LOOKING"

Poisons by the dozens are in every home. This year, over 31,000 people will be accidentally poisoned by common household items in the Detroit and Wayne County areas alone. More than 20,000 of these people will be children under ten. Many of these children will be toddlers under the age of two. Very little kids may take a gulp of floor cleaner or swallow a bottle of vitamin pills because they don't know any better. But you do.

Do you know what's poison in your home?

Medicines and Health Aids

Pills, vitamins, cough preparations, prescription drugs may be good for some people at the right time in the right amounts. But a little kid can get into big trouble by taking a pill which was meant for a grown-up — and bigger trouble by taking the whole bottle. Never tell a child that medicine is candy. Never give a child more medicine than the directions tell you to. Remember that little kids like to imitate grown-ups, including taking the pills they see grown-ups take.

Pesticides

Bug sprays, rat killers, ant poison and the like can poison people too — especially children. Keep them out of reach of children. Keep crumbs of food from meals and snacks cleaned up so animal and insect pests won't find reason to visit your home!

Hobby and Home Improvement Materials

Glues, paints, varnishes, solder and thinners are poisonous if swallowed. The vapors in paint removers are especially harmful to breathe — for children and for grown-ups. Do projects which require these products outdoors or in well-ventilated rooms — and don't eat or leave food in these areas.

Home and Laundry Products

These often contain harsh chemicals which cause immediate and severe injury if swallowed. Many are equally harmful to the skin and eyes. For your own safety as well as for the child's, handle and store with extreme caution things like: detergents, bleach, disinfectants, window cleaners, drain openers, room deodorizers, oven cleaners, furniture polish...

Beauty and Grooming Aids

These are colored and scented to look and smell good — good enough to make a child eat or drink them. Most would not normally be considered dangerous. If a child swallows a large quantity of a cosmetic, hair, skin or nail care product, these products can be dangerous too.

Dust, Dirt and Peeling Paints

Lead is still a major cause of permanent injury. Dust and scrapings from old painted surfaces may contain lead. If your home has places where paint is flaking off, keep the flakes swept up. Children sometimes eat paint chips instead of food. Don't let little kids chew on window sills or other painted surfaces.

Do you know where the poisons are in your home?

KITCHEN
- ☐ oven cleaner
- ☐ drain cleaner
- ☐ furniture polish & wax
- ☐ metal polish
- ☐ powder & liquid detergents
- ☐ scouring powder
- ☐ dishwasher detergent
- ☐ other cleaners
- ☐

BATHROOM
- ☐ prescription drugs
- ☐ diet pills
- ☐ aspirin & Tylenol
- ☐ other pills
- ☐ tile cleaner
- ☐ drain cleaner
- ☐ toilet bowl cleaner
- ☐ disinfectants
- ☐ rubbing alcohol
- ☐ lotions & liniments
- ☐ hair remover
- ☐ nail polish & remover
- ☐ shampoo, wave lotion, hair spray
- ☐ perfume, colognes, shaving lotion
- ☐

CLOSETS, ATTICS STORAGE PLACES
- ☐ rat poison
- ☐ ant poison
- ☐ moth balls
- ☐ pet products
- ☐

BEDROOM
- ☐ prescription drugs
- ☐ other drugs
- ☐ cosmetics
- ☐

LAUNDRY
- ☐ bleach
- ☐ ammonia
- ☐ soaps & detergents
- ☐ bluing, dyes
- ☐ spot grease removers
- ☐ fabric softeners
- ☐

GARAGE, BASEMENT, WORKSHOP
- ☐ gasoline
- ☐ kerosene
- ☐ lubricating oil
- ☐ lighter fluid
- ☐ antifreeze
- ☐ paints & stains
- ☐ paint stripper
- ☐ paint thinner
- ☐ varnish & shellac
- ☐ glues & adhesives
- ☐ art supplies
- ☐ bug killers
- ☐ weed killers
- ☐ fertilizer
- ☐ swimming pool chemicals
- ☐

ALL ROOMS
- ☐ tobacco products
- ☐ alcoholic beverages
- ☐ room deodorizers
- ☐ houseplants
- ☐

You can't keep the little kids in your house from exploring but you can

be sure the treasures they find aren't POISON.

- Keep potential poisons out of sight and out of reach.
- Read labels, follow directions.
- Don't use or store pesticides or cleaning supplies near food or drink.
- Keep products in original containers. In case of poisoning you will need to know what is in the product.
- Throw away prescriptions and household products you don't use anymore.
- If you're using a hazardous product when the phone or doorbell rings, take the product with you.
- Mop or vacuum floors often. Little kids play there a lot and they often put their fingers in their mouths.

Trying on a hat from your closet can be fun for your little kid but

sampling medicine from your bathroom cabinet could be TRAGEDY.

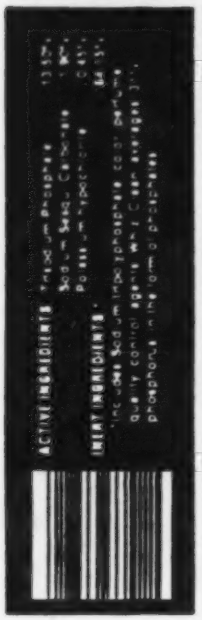
Source: Brochure prepared by the East Michigan Environmental Action Council, 21220 West Fourteen Mile Rd., Birmingham, MI 48010. For copies of the brochure, telephone (313) 258-5188.

Classroom Worksheet

HOUSEHOLD CLEANERS – READING LABELS

Bleaches out food stains
Cleans and Disinfects

USE WHIZ CLEAN ANYWHERE IN YOUR HOME



KITCHENS

Sinks: Whiz Clean cleans and whitens porcelain, cleans stainless steel to a sparkle.

Countertops, Plastic Surfaces: Whiz Clean bleaches through food, beverage, ink stains. Wet, sprinkle Whiz Clean, let soak for a while, then rub only as needed, rinse. Do not soak for prolonged periods.

Pots & Pans, Stoves, Ceramic Cookware: Whiz Clean cuts grease, scours off cooked-on food.

BATHROOMS

Sinks, Tubs, and Showers: Whiz Clean disinfects as it cleans.

Ceramic Tile, Fixtures: Whiz Clean cleans to a sparkle.

Toilet Bowls: Whiz Clean cleans and sanitizes. Sprinkle Whiz Clean liberally into bowl, scour and flush.

Vanity Tops, Plastic Fixtures: Special care should be taken in cleaning these surfaces. Let Whiz Clean work a minute or so with plenty of water. Rub gently if needed, and rinse.

FOR TOUGH JOBS: For easiest results, let Whiz Clean work with water a minute or so, then rub as needed and rinse.

Other Uses: Whiz Clean cleans away soil and stains on cement floors, garbage cans, auto chrome, whitewall tires, outdoor grills.

1. What is the brand name of this product? _____
2. What is the product used for? _____
3. What is the total weight of the product? _____
4. List each active ingredient (chemical name and % weight) and calculate the weight for each:

Chemical Name	% Total Weight	Weight of Ingredient

5. How should this product be used or applied? Circle all directions listed on the label above.
6. Are any of the directions warnings or precautions for protecting health and the environment?

   _____YES _____NO

7. What types of warnings or precautions might be included on the label of a household hazardous product? (List your suggestions on the back of this worksheet).

Source: Metropolitan Seattle Sleuth report

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HOUSEHOLD HAZARDOUS PRODUCTS-READING LABELS

Instructions: With assistance from a parent or an adult, find a container of a household hazardous product, such as a household cleaner. Read the label carefully. Then answer the questions.

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1. What is the brand name of the product (if any)? _____
2. What is the product used for? _____
3. What is the total weight or volume of the product? _____
4. List each active ingredient (chemical name and % weight or volume) and calculate the weight or volume of each ingredient:

Chemical Name	% Weight or Volume	Weight or Volume of Ingredient

5. Does the label tell you how much to apply each time the product is used? _____
6. How many applications would it take to use up the entire container? (To answer #6, ask an adult to help you make an estimate) _____
7. List instructions for using the product:

_____

_____

_____

8. List instructions for storing or keeping the product (if any):

_____

_____

_____

9. List instructions for disposing of the product or container (if any):

_____

_____

_____

10. Circle the instructions (from #7, #8, and #9) which are warnings or precautions for protecting health and the environment.

Source: East Michigan Environmental Action Council

Household Materials Most Likely To Be Groundwater Hazards:

TIPS FOR DISPOSAL

Before using the disposal methods on this list, try to use up the material in the way it was intended, or give it to a friend who will use it. **Never** pour hazardous materials onto the ground, on the road, or into any water body.

	Material	How to Dispose or Discard
AUTOMOTIVE PRODUCTS AND OIL	Fuel oil	For small quantitites, treat like transmission fluid (see below). For larger amounts, arrange to give to a friend with an oil furnace. **Note:** Leaks in underground oil tanks can be a serious source of pollution of the groundwater. Have tanks checked for leaks.
	Used motor oil from car, tractor, snowmobile, or lawnmower	Pour into plastic jug or other container and take to used oil collection center, such as a service station.
	Used radiator fluid, anti-freeze, brake fluid, or transmission fluid	Pour into plastic or metal container filled with kitty litter, dirt, or sawdust. Double wrap container in plastic bags and dispose in garbage.
PESTICIDES AND HERBICIDES	Insecticides Weed killers	Apply as directed on label to an outdoors area away from water. If large quantities of old pesticides are found, telephone the Oakland County Health Department (313) 858-1312 or the Hazardous Waste Division, Michigan Department of Natural Resources (517) 373-2730 for advice.
PAINT PRODUCTS AND SOLVENTS	Oil-based paints, Varnish, stains Thinners Wood preservatives Kerosene Gasoline	Allow to evaporate or dry out in an outdoors area away from children or pets. When mostly dry, add kitty litter, dirt, or sawdust. Then wrap with plastic bags and dispose in garbage. **Note:** Paint thinner, alcohol, gasoline, and used cleaners and solvents can often be reused if the sediment is allowed to settle and the clear liquid is poured off.

Note: For disposal of household materials at a hazardous waste disposal facility call Jim Stock at Wayne Disposal Company near Ypsilanti, (313) 697-7830.

Source: East Michigan Environmental Action Council

HOME PRACTICES TO PROTECT THE ENVIRONMENT

The list below includes household hazardous materials which are most likely to become hazards in the environment. With the help of an adult, check off the materials found in your home. Find out whether the material can be used up or whether the extra can be given away. If the material cannot be given away, identify the best method for disposal, using the handout titled "Household Hazardous Materials Most Likely to Be Groundwater Hazards: Tips for Disposal."

HOUSEHOLD HAZARDOUS MATERIAL	IS IT IN YOUR HOME?	CAN IT BE USED UP?	IF NOT, CAN IT BE GIVEN AWAY?	OTHERWISE, LIST THE BEST PRACTICE TO DO WITH THE EXTRA
Fuel oil				
Used motor oil				
Used anti-freeze				
Used brake fluid				
Insecticides				
Weed killers				
Paint				
Varnish, stains				
Thinners, solvents				
Wood preservatives				
Kerosene				
Gasoline				

Source: East Michigan Environmental Action Council